

What is claimed is

1. A head unit cleaning method for cleaning a head unit including: an ink jet head having a plurality of ink channels, the ink jet head ejecting ink while the head unit is in a printing posture; a buffer tank for storing ink to be supplied to the ink jet head, the buffer tank having a top wall formed with a first port and a second port; and a manifold disposed between and connected to the ink jet head and the buffer tank, the manifold distributing ink from the buffer tank to the plurality of ink channels in the ink jet head, the cleaning method comprising:

introducing cleaning fluid into the buffer tank through the first port to remove foreign matter from the head unit through the second port;

turning the head unit upside down with respect to the printing posture so that the second port is located in a lowermost position and the top wall slants down toward the second port; and

removing the cleaning fluid remaining in the head unit through the second port.

2. The head unit cleaning method according to claim 1, wherein the step of introducing the cleaning fluid includes maintaining the head unit in at least one of the printing posture and upside down with respect to the printing posture while introducing the cleaning fluid.

3. The head unit cleaning method according to claim 1,  
wherein the step of introducing the cleaning fluid includes  
applying a positive pressure to the cleaning fluid to  
introduce the cleaning fluid into the buffer tank through  
5 the first port.

4. The head unit cleaning method according to claim 1,  
wherein the step of removing the cleaning fluid includes  
introducing air into the buffer tank through the first port  
at a pressure greater than atmospheric pressure.

10 5. The head unit cleaning method according to claim 1,  
wherein while the head unit is in the printing posture, the  
ink jet head ejects ink that includes a fluid and a coloring  
agent, and the cleaning fluid has the same composition as  
the fluid of the ink without the coloring agent.

15 6. The head unit cleaning method according to claim 1,  
wherein the first port is for supplying ink from an ink  
supply source into the buffer tank and the second port is  
for discharging air bubbles separated from ink in the buffer  
tank while the head unit is in the printing posture.

20 7. The head unit cleaning method according to claim 1,  
wherein the buffer tank of the head unit further includes a  
bottom wall that is substantially flat, and side walls that  
rise up from outer edges of the bottom wall, and the top  
wall is slanting and in confrontation with the bottom wall,  
25 the cleaning fluid flowing down from the bottom wall, along

the slanting top wall, to the second port in the cleaning fluid removing step.

8. The head unit cleaning method according to claim 4, wherein the buffer tank further includes a bottom wall formed with a third port communicating with the manifold, and a filter attached to a projected inner surface of the bottom wall to cover the third port, and in the cleaning fluid removing step the filter hinders the air introduced into the buffer tank from passing therethrough.

9. A method of introducing ink into an unused head unit including: a buffer tank for storing ink, the buffer tank having an ink outlet and an ink supply path, the ink supply path being for connecting to an ink supply source; and an ink jet head having a plurality of ejection nozzles through which ink supplied from the ink outlet is ejected onto a recording medium, the ink introducing method comprising:

maintaining the buffer tank filled with a preservation fluid before the head unit is used;

introducing the preservation fluid from the buffer tank into the ink jet head before introducing ink into the head unit;

expelling the preservation fluid from the ink jet head; and

introducing ink from the ink supply source into the

ink jet head through the buffer tank.

10. A method of manufacturing a buffer tank for an ink jet recording apparatus, the buffer tank being for holding ink that is supplied from an ink supply source through a supply path and for supplying the ink to an ink jet head, the manufacturing method comprising:

preparing a bottom lid with an ink outlet for supplying ink to the ink jet head, the bottom lid having one side designated to face inward when joined into the buffer tank;

attaching a filter to the bottom lid so as to cover the ink outlet from the side designated to face inward;

preparing a top lid with an ink inflow port for receiving ink from the supply path;

subjecting at least the filter on the bottom lid to a process for enhancing hydrophilic properties; and

joining the bottom lid and top lid to form the buffer tank, wherein the filter is located inside the buffer tank.

11. The method of manufacturing the buffer tank according to claim 10, wherein at least the filter is subjected to plasma processing.

12. An ink jet recording apparatus, comprising:

an ink jet head for ejecting ink droplets;

a buffer tank for storing ink and supplying ink to the ink jet head, the buffer tank including a bottom wall, a top

wall, and a side wall, the bottom wall having an outer edge,  
the top wall being in confrontation with the bottom wall  
through a space for holding ink, the top wall having an  
outer edge, and the side wall being connected to the outer  
5 edges of the bottom wall and the top wall;

an outflow port formed in the top wall, the outflow  
port being for removing bubbles from the space; and

an ink inflow port formed in the top wall of the  
buffer tank, the ink inflow port having a cylindrical shape  
10 and projecting down towards the bottom wall, the ink inflow  
port having a bottom end nearest the bottom wall, the bottom  
end being formed with a notch that faces towards the outflow  
port.

13. The ink jet recording apparatus according to claim  
15 12, wherein the notch of the ink inflow port is submerged in  
the ink in the buffer tank.

14. The ink jet apparatus according to claim 12,  
wherein the outflow port is located in a highest position of  
the top wall of the buffer tank while the ink jet head is in  
20 a printing posture for ejecting ink droplets.

15. An ink jet recording apparatus comprising:

a head unit including:

a buffer tank for storing ink including an ink  
outlet and an ink supply path, the ink supply path being for  
25 connecting to an ink supply source, the buffer tank being

filled with a preservation fluid before the head unit is used; and

an ink jet head including a plurality of ejection nozzles for ejecting ink that is supplied from the ink outlet onto a recording medium; and

a fluid introducing unit that introduces the preservation fluid from the buffer tank into the ink jet head and expels the preservation fluid from the ejection nozzles to make the head unit ready for use.

16. The ink jet recording apparatus according to claim 15, wherein the preservation fluid includes a surface active agent.

17. The ink jet recording apparatus according to claim 15, wherein the ink supply source supplies ink that includes a fluid and a coloring agent, the preservation fluid having the same composition as the fluid of the ink without the coloring agent.

18. The ink jet recording apparatus according to claim 15, wherein the buffer tank further includes a filter located in the ink outlet, the filter having a mesh size small enough to prohibit the preservation fluid in the buffer tank from passing through the filter while the supply path is in a sealed condition.

19. The ink jet recording apparatus according to claim 15, wherein the ink supply path of the buffer tank has an

open end for connecting to the ink supply source, the ink jet head further includes a cover that seals the plurality of nozzles and the buffer tank further includes a cover that seals the open end of the ink supply path.

5           20. An ink jet recording apparatus for recording onto a recording medium, the ink jet recording apparatus comprising:

an ink supply source that supplies ink;

a supply path connected to the ink supply source;

10           a buffer tank that stores ink supplied from the ink supply source through the supply path;

an ink jet head having a plurality of ejection nozzles from which ink supplied from the buffer tank is ejected onto the recording medium;

15           a top lid member forming at least a top wall of the buffer tank, the top lid member being formed with an ink inflow port that is connected to the supply path;

a bottom lid member forming a bottom wall of the buffer tank, the bottom lid member being formed with an ink outlet for supplying ink to the ink jet head; and

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a filter attached to the bottom lid to cover the ink outlet from inside the buffer tank, at least the filter having been subjected to a process for enhancing hydrophilic properties.

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